

MARKED-UP COPY OF AMENDED CLAIM

7. (Twice Amended) A method for bleaching medium consistency cellulose pulp comprising the steps of providing a stream of said cellulose pulp, generating a stream of ozone-containing gas ~~having an~~ consisting essentially of a carrier and ozone at a concentration of at least 20% by weight ~~formed from pressurized oxygen~~, and radially injecting said stream of ozone-containing gas into said stream of cellulose pulp so as to provide a stream of bleached cellulose pulp, ~~whereby said cellulose pulp may be bleached without the use of~~ using a high-sheer mixer during said steps.

REMARKS

Support for the amendment to claim 7 can be found, *inter alia*, in line 1 of paragraph 0024 of the specification. Support for new claim 14 can be found, *inter alia*, in paragraph 0030 of the specification and in claim 7. Support for new claims 15 can be found, *inter alia*, in lines 8-10, paragraph 0023 of the specification. Support for new claims 16 can be found, *inter alia*, in lines 12-13, paragraph 0023 of the specification. Support for new claims 17-18 can be found, *inter alia*, in Table 1, paragraph 0034 of the specification. Support for new claims 19 can be found, *inter alia*, in lines 7-8, paragraph 0029 of the specification. Support for new claims 20 can be found, *inter alia*, in claim 1 and paragraph 0015 of the specification. Applicants contend that the amendments to claim 7 and the addition of new claims 14-20 are fully supported by the specification and do not raise any issue of new matter. In addition, Applicants have concurrently filed a Request for Continued Examination ("RCE"). Therefore, entry of the claim amendment and the new claims are respectfully requested. Upon entry of this Amendment, claims 7-20 will be under examination.

CLAIM REJECTION UNDER 35 U.S.C. §103(a)

Claims 7-12 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Bentvelzen et al., U.S. Patent No. 4,295,927 ("Bentvelzen") in view of page 4, lines, 15-24 of the specification or AT 403 704 or Sixta et al. (Sixta"). For the reasons stated below, reconsideration and withdrawal of this rejection are respectfully requested.

As suggested by Examiner Alvo in the July 17, 2002 telephone interview with the undersigned, claim 7 has been amended to include a recitation that "ozone-containing gas consisting essentially of a carrier and ozone at a concentration of at least 20% by weight." The Examiner stated that this limitation would distinguish the claims over the cited prior art.

Applicants would also like to point out that the primary reference, Bentvelzen disclosed a pulp bleaching process that is completely difference from the claimed method in the amended claim 7. Specifically, Bentvelzen disclosed three-step pulp bleaching using either oxygen-oxygen-chlorine or oxygen-chlorine-oxygen. Bentvelzen also disclosed, in Col. 32, lines 24-26, that the chlorine step can use "combination of chlorine or chlorine dioxide-C_D, D_C or mixture of chlorine and chlorine dioxide, hypochlorites, peroxides or ozone." To the contrary, the claimed method in the amended claim 7, bleaches "medium consistency cellulose pulp

comprising the steps of providing a stream of said cellulose pulp, generating a stream of ozone-containing gas consisting essentially of a carrier and ozone at a concentration of at least 20% by weight, and radially injecting said stream of ozone-containing gas into said stream of cellulose pulp so as to provide a stream of bleached cellulose pulp without using a high-sheer mixer during said steps." Bentvelzen does not disclose the use of "ozone-containing gas consisting essentially of a carrier and ozone at a concentration of at least 20% by weight" in any of its bleaching steps. Nor does Bentvelzen disclose "radially injecting said stream of ozone-containing gas into said stream of cellulose pulp."

Moreover, there is no teaching or suggestion that Bentvelzen can be combined with any of the secondary references. Even if these references can be combined, the combination does not teach or suggest the claimed invention because none of the three secondary references would remedy the deficiencies of Bentvelzen. AT 403 704, page 4, lines, 15-24 of the specification or Sixta does not disclose the use of "ozone-containing gas consisting essentially of a carrier and ozone at a concentration of at least 20% by weight" and "without using a high shear mixer" in bleaching paper pulp of medium consistency. In fact, Sixta does not even recognize that paper pulp can be bleached without the use of a high-shear mixer and all the examples in Sixta involves the use of low concentration of ozone with a high-shear mixer to bleach paper pulp.

Applicants also contend that the combination does not disclose the additional elements of the dependent claims 8-12, e.g., "generating said stream of ozone-containing gas from a mixture of said pressurized oxygen and at least one other gas or liquid" in claim 8; "radially injecting said stream of ozone-containing gas into said stream of cellulose pulp at a pressure of at least 10 bar" in claim 9; "radially injecting said stream of ozone-containing gas into said stream of cellulose pulp from a plurality of nozzles adapted to direct said ozone-containing gas into said stream of cellulose pulp" in claim 10; "radially injecting said stream of ozone-containing gas into said stream of cellulose pulp substantially perpendicularly to said stream of cellulose pulp" in claim 11 and "feeding said stream of bleached cellulose pulp to a dynamic low to medium intensity mixer" in claim 12.

Therefore, the amended claim 7 and its dependent claims 8-12 are nonobvious over Bentvelzen in view of AT 403 704, page 4, lines, 15-24 of the specification or Sixta, and reconsideration and withdrawal of this rejection are respectfully requested.

CLAIM REJECTION UNDER 35 U.S.C. §103(a)

Claim 13 stands rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Bentvelzen et al. in view of page 4, lines 15-24 of the specification or AT 403 704 or Sixta et al. as applied to claim 7 above, and further in view of Cheng.

As stated in Applicants' response to the obviousness rejection of claims 7-12, the amended claim 7 is nonobvious over Bentvelzen in view of AT 403 704, page 4, lines, 15-24 of the specification or Sixta. Claim 13 is dependent upon the amended claim 7 and incorporates all the elements of the amended claim 7. Moreover, Cheng does not remedy the deficiency of Bentvelzen in view of AT 403 704, page 4, lines, 15-24 of the specification or Sixta. Therefore, claim 13 is nonobvious over the combination of Bentvelzen in view of AT 403 704, page 4, lines, 15-24 of the specification or Sixta, and further in view of Cheng. Accordingly, consideration and withdrawal of this ground of rejection are respectfully requested.

CLAIM REJECTION UNDER 35 U.S.C. §112, SECOND PARAGRAPH

Claim 7 stands rejected under 35 U.S.C. §112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Specifically, the Office Action objects to the use of the term "from pressurized oxygen".

Applicants have amended claim 7 to delete the reference to the term "formed from pressurized oxygen". Therefore, this ground of rejection is moot. Accordingly, reconsideration and withdrawal of this rejection are respectfully requested.

NEW CLAIMS

Applicants have introduced new claim 14 to recite an additional feature of the invention, i.e., "wherein said ozone-containing gas has a mean residence time of about 10 to about 40 seconds in said cellulose pulp." New claims 15-19 are dependent upon claim 14 and further include additional features of "wherein said ozone-containing gas has an ozone

concentration of more than 300 g/m³"; "wherein said bleaching step is conducted without using an upflow bleach tower"; "wherein said bleaching step is conducted without using a mixer"; "wherein the injection of said stream of ozone-containing gas into said stream of cellulose pulp creates a gas void of no more than 12%"; and "wherein sufficient number of nozzles are provided for even distribution of said ozone-containing gas in said stream of cellulose pulp", respectively. Applicants have also added new claim 20 to emphasize that "ozone-containing gas which is substantially free from chlorine and has an ozone concentration of at least 20% by weight."

Applicants contend that these new claims are nonobvious over the cited prior art references, either individually or in any combination. Therefore, allowance of new claims 14-20 is respectfully requested.

CONCLUSION

In view of the amendments and remarks, further and favorable consideration of claims 7-20 and the issuance of a Notice of Allowance with respect to these claims are earnestly solicited.

No fee is deemed necessary in connection with the filing of this Amendment. However, if any fee is required, the Examiner is authorized to charge any such fee to our Deposit Account No. 12-1095.

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